

## CLAIMS

1. A microporous polyethylene film, comprising a blend that comprises a high density polyethylene copolymer which has a melt index (MI) of 0.1 to 100 and a content of an  $\alpha$ -olefin unit with 3 or more carbon atoms of 0.1 to 1% by mole; and a high density polyethylene which has a viscosity average molecular weight (Mv) of at least 500000 to 5000000, wherein the blend has an Mv of 300000 to 4000000 and a content of an  $\alpha$ -olefin unit with 3 or more carbon atoms of 0.01 to 1% by mole.
2. A microporous polyethylene film, comprising a blend that comprises a high density polyethylene copolymer which has a melt index (MI) of 0.1 to 100 and a content of an  $\alpha$ -olefin unit with 3 or more carbon atoms of 0.1 to 1% by mole; and a homopolyethylene which has an Mv of at least 500000 to 5000000, wherein the blend has an Mv of 300000 to 4000000 and has a content of an  $\alpha$ -olefin unit with 3 or more carbon atoms of 0.01 to 1% by mole.
3. A microporous polyethylene film, comprising a blend that comprises a high density polyethylene copolymer comprising an  $\alpha$ -olefin unit with 3 or more carbon atoms, and a high density polyethylene which has an Mv of at least 500000 to 5000000, characterized in that the microporous polyethylene film has a weight fraction measured by GPC of a component having a molecular weight of 1000000 or less of 1 to 40%, and a

weight fraction measured by GPC of a component having a molecular weight of 10000 or less of 1 to 40%, the component having a molecular weight of 10000 or less has a content of an  $\alpha$ -olefin unit with 3 or more carbon atoms of 0.1 to 1% by mole, and the blend has an Mv of 300000 to 4000000, and a content of an  $\alpha$ -olefin unit with 3 or more carbon atoms of 0.01 to 1% by mole.

4. The microporous polyethylene film according to any one of claims 1 to 3, wherein the  $\alpha$ -olefin is propylene.

5. The microporous polyethylene film according to any one of claims 1 to 4, wherein the polyethylene having an Mv of 500000 to 5000000 is a blend of two or three kinds selected from the following polyethylenes (A), (B) and (C):

(A) the polyethylene having an Mv of 1500000 or more and less than 5000000; (B) the polyethylene having an Mv of 600000 or more and less than 1500000; and (C) the polyethylene having an Mv of 250000 or more and less than 600000.

6. The microporous polyethylene film according to any one of claims 1 to 4, wherein the polyethylene having an Mv of 500000 to 5000000 is an ultrahigh molecular weight polyethylene having an Mv of 1500000 or more.

7. The microporous polyethylene film according to any one of claims 1 to 6, having a film rupture temperature of 150°C or higher.

8. The microporous polyethylene film according to any one of claims 1 to 7, having a shrinkage force at 150°C of 2N or less.
9. The microporous polyethylene film according to any one of claims 1 to 8, having a fusing temperature of 140°C or lower.
10. The microporous polyethylene film according to any one of claims 1 to 9, having a thickness 5 to 24  $\mu\text{m}$ .
11. The microporous polyethylene film according to any one of claims 1 to 10, having a porosity of 30 to 70%.
12. The microporous polyethylene film according to any one of claims 1 to 11, having an air permeability of 100 seconds or more and 600 seconds or less.
13. A battery separator, comprising a microporous film according to any one of claims 1 to 12.